

REMARKS

The Office Action mailed on May 14, 2008, has been reviewed and the comments of the Patent and Trademark Office have been considered. Prior to this paper, claims 1-20 were pending in the application. By this paper, Applicants cancel, without prejudice or disclaimer, claims 1-20, and add claims 21-31. Therefore, claims 21-31 are now pending.

Applicants respectfully submit that the present application is in condition for allowance for at least the reasons that follow.

Claim Objections

Claims 15 and 20 are objected to as containing informalities. Claims 15 and 20 have been cancelled, and claims 21-31 are not believed to suffer from the alleged informalities.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 1-20 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-20 have been cancelled, and claims 21-31 are not believed to suffer from the alleged indefiniteness afflicting previously claims 1-20.

Claim Rejections Under 35 U.S.C. §102

Claims 1-3, 6, 7, 9-12 and 20 stand rejected under 35 U.S.C. § 102 as being anticipated by JP 8-096820. Further, claims 1, 2, 6, 9, 13, and 20 stand rejected under 35 U.S.C. § 102 as being anticipated by JP 2002-280024. In response, in order to advance prosecution, and without prejudice or disclaimer, Applicants cancel 1-3, 6, 7, 9-13 and 20, and add new claims 21-31.

In view of the fact that various previously pending dependent claims were not rejected under 35 U.S.C. § 102, in view of the fact that claim 21 recites that “the projections differ in at least one of a height and a width thereof,” in view of the fact that claim 27 recites that “the projections differ in at least one of a height and a width thereof,” and in view of the fact that claim 28 recites that “at least one of a height and a width of the projection continuously changes along the longitudinal direction of the rib,” it is respectfully submitted that no claim is anticipated for reasons consistent with the May 2008 Office Action.

Claim Rejections Under 35 U.S.C. §103(a)

In the Office Action, claims 4, 5, 8, 16 and 17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over JP 8-096820. Further, claims 14, 15, 18 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 8-096820 in view of Wilson (U.S. Patent No. 5,641,586). In response, in order to advance prosecution, and without prejudice or disclaimer, Applicants cancel claims 4, 5, 8 and 14-19, and add claims 21-31.

Applicants submit that claims 21-31 are not obvious in view of JP 8-096820.

JP 8-096820 fails to disclose that the alleged projections (elements 246, 346 and 446) differ in at least one of a height and a width thereof, as is required by claims 21-27. JP 8-096820 also fails to disclose that at least one of a height and a width of the alleged projections continuously changes along the longitudinal direction of the alleged rib, as is required by claims 28-31.

The features regarding the heights / widths of the protrusions in claims 21-31 are not simply a matter of mere design choice. Instead, because the projections differ in at least one of a height and a width thereof (claims 21-27), or because at least one of a height and a width of the projections continuously changes along the longitudinal direction of the rib (Claims 28-31), it is possible to enable a selective adjustment of gas diffusion inside the porous electrode. In particular, the amount of “short-circuit gas” may be more efficiently reduced as the projections become taller or wider. The height and the width of the projections may be changed according to the gas flow velocity within the gas flow path. Also, due to the height/width features of the projections, it is possible to enable a more precise system adjustment which takes into consideration the specific properties of the fuel cell, such as, for

example specific pressure distribution on the surface of the electrode or specific thermal stress distribution thereon.

This precise, selective adjustment of gas diffusion according to the present invention by differing height and/or width of the projections on the rib or by continuously changing height and/or width of the projection is neither mentioned nor rendered obvious in JP 08-096820. Instead JP 8-096820 merely discloses a fuel cell having an electrolyte membrane (element 20), which is disposed between two gas diffusion electrodes (elements 30). In Fig. 7 of JP 8-096820, a collector (element 240) is depicted with surface ribs (elements 242) which are formed so as to define gas passages (elements 244) in which a reaction gas flows. The ribs (elements 242) are in clear contact with the left gas diffusion electrode (element 30). The upper ends of the ribs (elements 242) are equipped with striations (elements 248), having the exact same depth, so that the remaining portions of the ribs project towards the left gas diffusion electrode. In Fig. 9 and paragraph 0044 of the translation of JP 8-096820 provided by the PTO, it is disclosed that the gas diffusion electrodes (elements 30) are pressed "harder" by the ridge portion (element 346) of the rib (element 342) in a central area of the contact portion (feature 34), wherein a compressed and electrochemically inactive region is formed. It is furthermore taught in paragraph 0047 of the translation provided by the PTO that the end of the rib (342) may be formed in a one-sided slope, or as a portion having an arched or convex section.

Furthermore, (i) JP 8-096820 does not present a sufficiently sophisticated system in which a scenario would arise prompting the ordinary artisan (who is by definition a non-innovator) to need / be compelled to modify the system of JP 8-096820 to obtain the resulting performance feature obtained by the recited geometries of the projections, or, in the alternative, (ii) the ordinary artisan would not have recognized that the system of JP 8-096820 presents the aforementioned short circuit problem, thus needing modification to arrive at the present invention. That is, the ordinary artisan would not have had reason to modify JP 8-096820 according to the claims to obtain the feature of selective adjustment of gas diffusion inside an electrode. ***There is nothing on the record to the contrary.*** Further, JP 8-096820 teaches away from this feature, as may be seen in Figs. 1 and 7 of JP 8-096820, where it is shown that, on the left-hand side of the electrolyte membrane (element 20) gas passages

(elements 44, 244) extend into a direction perpendicular to the plane of the drawing, while on the right-hand side of the electrolyte membrane (element 20), the gas passages extend in a top-down direction within the plane of the drawing so as to extend orthogonally with regard to the first-mentioned gas passages. Furthermore, the gas passages on the left-hand side and on the right-hand side of the electrolyte membrane are arranged in a straight-lined manner without windings.

Thus, in JP 8-096820, as the gas passages of the respective electrodes are straight-lined, the possibility that reaction gas might seep out at a winding portion of a porous electrode so as to flow from one winding portion to an adjacent winding portion and thus form a short-circuit would not have been recognized by the ordinary artisan. Indeed, in this relatively unsophisticated system, it likely is not a risk, and to the extent it is a risk, the ordinary artisan would not have recognized such. Again, ***there is nothing on the record to the contrary.***

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In rejecting previously pending claims 4, 5, 8 16 and 17, the Office Action proffers a series of factual assertions (e.g., on page 5 of the Office Action) to support the basis for the alleged motivation to modify JP 8-096820. These factual assertions are not substantiated with any evidence or rationale. It appears that, on page 5 of the Office Action, the Office Action relies on common knowledge in the art, as is discussed and permitted in MPEP § 2144.03. However, there are explicit guidelines that must be followed when taking official notice (e.g., “the technical line of reasoning underlying a decision to take such notice must be clear and unmistakable” MPEP § 2144.03(B)) – guidelines that have not been followed in the Office Action.

Further, Applicants note that § 2144.03(C) allows an applicant to traverse such an assertion, and that when an applicant does so, “the examiner must provide documentary evidence in the next Office Action if the rejection is to be maintained.” (MPEP § 2144.03(C).) Absent a citation by the PTO of a reference that can be evaluated for all its teachings, Applicants hereby traverse the assertion that it would have been common

knowledge in the art that “reactant gas pressure is highest at the inlet of the flow field” of JP 8-096820, that “the reduction of contact pressure at the beginning of a flow field” would have been known to “be advantageous,” that the “use of a plurality of ribs differing in height or width in an upstream-downstream direction would be obvious based on” the alleged disclosure in JP 8-096820 of plural projections on each rib, and that “the number of projections on the ribs of the [alleged] two separators [of JP 8-096820] may be varied to account for pressure differences between the reactant gasses.” Further, Applicants traverse the assertion that the ordinary artisan would have recognized that such an alleged pressure difference would have existed, assuming *arguendo* that such indeed would have existed in JP 8-096820. **Applicants thus request, relying on § 2144.03, that the PTO cite a reference and exactly identify where such a reference teaches the alleged knowledge in the art, or else allow the claims.**

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In summary, the pending claims are not obvious. Allowance is requested.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. § 1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

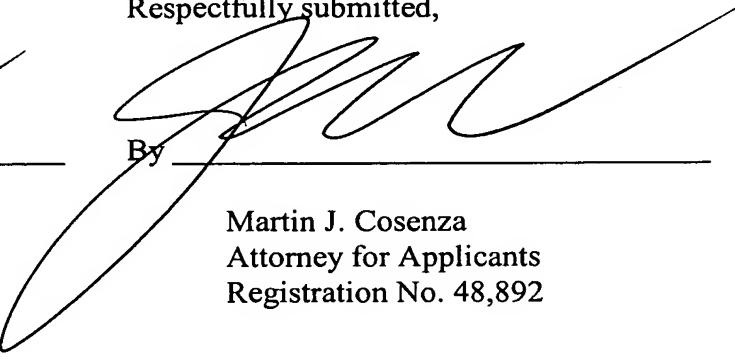
Examiner Crepeau is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Date


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Respectfully submitted,

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